Workshop on Stem Cells and Regenerative Medicine

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Stem cells are pluripotent or multipotent cells possessing the ability to develop into specialized cells that ensure proper organ function. Because of their promise in regenerative medicine, over the past few years stem cells and so-called progenitor cells have been studied extensively as potential tools for the repair or replacement of defective organs in disease. Examples of these attempts include treatment of specific diseases of the nervous system, haematopoetic disorders, diabetes, skin replacement, ophthalmologic diseases, and treatment of cardiovascular diseases. The spectrum of scientific studies involving stem cells in basic, translational and clinical research is very large. In some fields it has already brought success, while practical perspectives for treatment of disease are still lacking in others.

The enormous pressure on the academic community to open new therapeutic frontiers as quickly as possible has also led to the underestimation of risks, to clinical trials that are partially disputed with respect to their basic scientific background and interpretation, and in rare instances, to misconduct. Even in cases where stem cell therapies are successful, the applications are largely empirical and the molecular mechanisms are not always understood. As a consequence, emphasis still needs to be put on gathering basic knowledge about the nature of stemness of any cell type, cell differentiation, organ and tissue development and stem cell/host tissue interactions, before major breakthroughs in therapeutic concepts are possible.

Research on human embryonic stem cells represents a special case, being for ethical reasons regulated by strict laws that vary from country to country. At the international level, organizations with the specific task of carrying out stem cell research have been founded in several countries. This reflects the large, albeit partially disputed, expectations for this type of research in our society. In many developed countries with reputations as leaders in biomedical research, stem cell research is carried out in a highly competitive environment, and partially supported by the medical and pharmaceutical industry. However, in the developing countries stem cell research is invisible in an international context. Therefore, the high calibre research in cell and developmental biology should be a sound basis for performing internationally recognized research in stem cell biology.

Objective:

The aims of this workshop are to foster basic knowledge and to recruit promising young scientists to this field.

Topics

1. Introduction to stem cell
2. Embryonic Stem cells
3. Adult Stem cells
4. Induced pluripotent Stem cells
5. Bioethics in stem cells research
6. Regenerative Medicine

A. Neurological disease

B. Cardiovascular disease

Facilators:

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